REMARKS

This paper is in response to the non-final official action of December 6, 2007, wherein (a) 1, 4, 5, 10-13, 18-20, and 25-34 were pending, and (b) claims 1, 4, 5, 10-13, 18-20, and 25-34 were newly rejected under 35 USC 103(a) as being obvious over Tsukahara, et al. US 4,827,516 ("Tsukahara").

By the foregoing, claims 1 and 25 have been amended to incorporate the limitations of claims 10 and 28, respectively, and claims 10 and 28 have been canceled.

Claims 1, 4, 5, 11-13, 18-20, 25-27, and 29-34 are pending and at issue. The outstanding rejection based on Tsukahara is respectfully traversed. Reconsideration is requested.

Each of the pending claims recites displaying a time domain envelope curve of a modulated input signal by digitally sampling a modulated input signal that is in the time-domain, Fourier transforming the digital samples, removing all negative frequency samples or all positive frequency samples from the Fourier-transformed samples including a zero frequency component, inverse Fourier transforming the sideband-cleaned, Fourier-transformed samples, and calculating the absolute values of the inverse-transformed samples.

Tsukahara does not disclose or teach a method of displaying or otherwise obtaining the time domain envelope of a modulated time domain signal. The Office appears to point to the function SEP (t, f) of Tsukahara as the claimed time domain envelope of a modulated time domain input signal. However, the SEP signal of Tsukahara is not a time domain envelope of a time domain input signal. Instead, the SEP signal is a series of frequency domain signals shown over a period of time.

Referring to the SEP graph shown in Figure 25 of Tsukahara, the SEP signal consists of a plurality of frequency domain signals sampled at roughly 2 ms intervals (Tsukahara uses the range of 1.7- 2ms; See Col. 10, line 59). More

specifically, the signals plotted on the f(Hz) versus log |SEP(t,f)| axes are, by definition, frequency domain signals, and thus, none of these signals are the claimed time domain envelope. Also, the set of values plotted on the log |SEP(t,F)| versus time axes is not the claimed time domain envelope of a time domain signal. Instead, the set of values on the log |SEP(t,F)| versus time axes represents a pattern showing a change in a frequency domain signal over time. While the change in the frequency signal is shown over time, the patterns represent frequency domain signals, not time domain envelopes (i.e., a time domain signal) of time domain modulated signals.

Furthermore, even if the Office considers the set of values plotted on the log |SEP(t,F)| versus time axes as representing a time domain signal (which Applicants submit it is not), the set of values is not an envelope curve that is generated in the manner recited by the pending claims. In particular, the claims recite Fourier transforming a time domain input signal to obtain a frequency domain signal, and inverse Fourier transforming the frequency domain signal back into a time domain signal. While the SEP signals along the f(Hz) versus log |SEP(t,f)| axes is generated by a Fourier transform, there is no inverse Fourier transform applied to generate a time domain signal. The SEP signal is purely a frequency domain graph having a time parameter.

Applicants further traverse the rejection of the pending claims because each of the claims recites removing all positive or all negative frequencies of the frequency domain signal including a level zero frequency component. Tsukahara does not disclose removing all positive or all negative frequencies of the frequency domain signal in addition to a level zero frequency component.

The office action cites absolute value circuit 115 of Tsukahara for removing all positive or all negative components of a frequency domain signal along with a level zero frequency component. Contrary to the examiner's opinion as expressed in the outstanding official action, the formation of absolute values in the absolute value circuit disclosed by Tsukahara cannot perform the operation of removing the entirety of all negative or positive frequencies from the spectrum. In particular, because the absolute value circuit 115 is positioned <u>after</u> the inverse

Fourier transformation circuit, it can only work with time-domain signals, and thus, does not perform the recited removal of all negative or all positive frequency components of a **frequency domain** signal. Applicants emphasize that applying an absolute value function to a time domain signal produces entirely different results than removing all positive or all negative components and a level zero frequency component from a **frequency domain** signal.

To provide the Office with a better understanding of the difference between Tsukahara and the claimed limitations, Applicants refer the Office to the attached Appendix A, containing Figs. A-D. Fig. A shows an exemplary unmodified spectrum in the frequency domain. Fig. B shows the spectrum from Fig. A after performing the step of "generating sideband-cleaned, Fourier-transformed samples…" of the claims. It is easily visible that (in this example) the entire negative half of the spectrum has been removed. Alternatively, the entire positive half of the spectrum may be removed. Further, claims 1 and 25 are amended to also remove the spectral component at a frequency of zero, which is also illustrated in Fig. B.

In comparison, Figs. C and D show the extracted portions of the spectrum according to Tsukahara. In reviewing Figs. C and D, Applicants refer the Examiner to Col. 19, lines 26-35 that specifically defines the function of spectrum analyzer 113, which is reproduced below for convenience.

> Spectrum extractor 113 extracts a spectrum of predetermined frequency range fA from the frequency spectrum output from Fourier transform circuit 111. Predetermined frequency range fA is set on the basis of pitch frequency fP detected by detector 112 in the following manner:
>
> $$fP \times n - f\frac{P}{2} < fA < fP \times n + fP/2$$
>
> where n is 0 or a positive integer. Col. 19, lines 26-35.

According to the section above, the spectrum analyzer of Tsukahara would operate on the unmodified spectrum of Fig. A as shown in Fig. C. Fig. C shows the extracted portion for n=0. A portion from -1/2 fP to +1/2 fP is removed.

This includes positive and negative frequencies. At the same time positive and negative frequency portions remain in the signal. In Fig. D two portions of the spectrum are removed for n=1. A first portion from -1 ½ fP to - ½ fP and a second portion from +½ fP to +1 ½ fP are removed. As in Fig. C, positive and negative frequency portions are removed. Also, positive and negative frequency portions remain. A portion around zero frequency also remains. The removed frequency portions from Tsukahara are therefore not the removed frequency portions according to the present invention (as shown in Fig. B).

Applicants further traverse the rejection of the previous claims 10 and 28 (whose limitations are now incorporated into claims 1 and 25, respectively) in view of Tsukahara. Previous claims 10 and 28 recite removing a level zero frequency component. The Examiner relies on Figs. 18A and 18B to show the removal of a level zero frequency component. However, Figs. 18A and 18B expressly show the opposite: that the zero frequency component is not removed. In particular, the portion of the signal at zero frequency is clearly shown in both Figs. 18A and 18B. Thus, the rejection is improper and should be withdrawn.

For all the foregoing reasons, it is believed the pending claims are of proper form and scope for allowance, and such action is solicited.

Should the examiner wish to discuss the foregoing, or any matter of form in an effort to advance this application toward allowance, he is urged to telephone the undersigned at the indicated number.

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Respectfully submitted,

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APPENDIX A